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# Analysis of the Factors Causing Delay in Project Work (Case Study: Governor Syarkawi Road, South Kalimantan)

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## ABSTRACT

Road Preservation. Sp. Handil Bakti (Sp. Serapat) – Km. 17 (By Pass Banjarmasin) based on the contract document was carried out on November 31, 2020 with a project implementation time of 776 calendar days and a maintenance time of 365 calendar days. Based on *Time Schedule*, in the 19th week of the period March 22 to March 28, 2021, the percentage weight of the work progress plan on the initial contract was 4.83%, while the realization of work progress was 2.28%, so the project experienced a delay of 2, 54%. This study used the interview method and distributed questionnaires to respondents. These respondents include Contractors, Supervision Consultants, and the KDP Technical Team. Analysis of quantitative data using non-parametric statistical methods, Spearman Rank correlation, Kendall correlation, and the average value. Based on the analysis of the data used, the factors that caused the project to experience delays were first, caused by Factor X2 (Scope and contract work documents) by the X2.2 indicator with a *Kendall* 0.728, *Spearman* 0.730 and a *Rank Mean* 3.03; the X2.3 indicator with a *Kendall* 0.797, a *Spearman* 0.802 and a *Rank Mean* 3.07; X2.5 indicator with a *Kendall* 0.800, a *Spearman* 0.805 and a *Rank Mean* 3.23. Second, due to the X6 (*Force Majeure*) factor by the X6.2 indicator with a *Kendall* 0.886, a *Spearman* 0.889 and a *Rank Mean* 3.77; the X6.3 indicator with a *Kendall* 0.940, a *Spearman* 0.941 and a *Rank Mean* 4.07.

Keywords: Delay factor, Correlation *Rank Spearman,* Correlation *Kendall, Rank Mean*.

## 1. INTRODUCTION

In a project, various kinds of obstacles are often found that can hinder the work process and of course this will affect the success of a project. The benchmark for the success of a project is if it can consider constraints in terms of cost/budget, quality, and time. This preservation project is carried out by the National Road Implementation Center (BPJN) of South Kalimantan, through the Regional II National Road Implementation Working Unit (PJN). based on contract documents implemented on November 31, 2020 with a project implementation time of 776 calendar days and maintenance time of 365 calendar days. Based on *Time Schedule*, in the 19th week of the period March 22 to March 28, 2021, the percentage weight of the work progress plan on the initial contract was 4.83%, while the realization of work progress was 2.28%, so the project experienced a delay of 2, 54%. Identifying the factors causing project work delays and identifying the dominant

project factors are very important things so that they can be a reference for all parties involved in project implementation so that the project planning and scheduling process can be carried out better and more thoroughly.

## 2. LITERATURE REVIEW

### Road Preservation Governor Syarkawi Road

Preservation is the activity of maintaining, rehabilitating, reconstructing, & widening roads to a sustainable standard in maintaining roads in a stable condition (SE Director General of Highways Number 9/SE/Db, 2015).

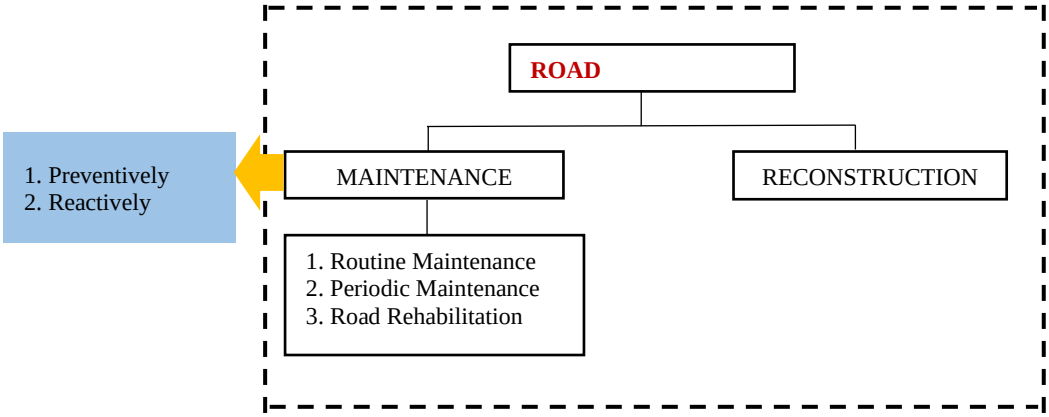


**Figure 1.** Scope of Road Preservation
Source: Ministry of Public Works, 2011

### Impact of Project Delay

According to Obrien JJ, 1976 concluded that the effect of delay resulted in the following losses:

a) For the owner or owner, delay in project completion will result in loss of income based on buildings that should have been used or leased.

b) For contractors, project delays will result in increased overhead due to additions during implementation, which will adversely affect the possibility of price increases due to inflation & rising labor wages, as well as holding the contractor's capital which may be used in other projects.

c) For consultants, project delays will cause time loss, due to the following delays, the consultant concerned will be hampered in scheduling other projects.

**Validity**

Ghozali (2009) states that the validity test is used to measure the validity of the questionnaire. A questionnaire is said to be valid if the question can reveal something that will be measured by the questionnaire.

**Reliability**

Reliability is the degree of accuracy, the level of trust/accuracy according to a measurement. A measurement using high reliability proves that the measurement can provide consistent or reliable measurement results & shows the extent to which a measurement can be trusted, & is free from*measurement error*.

***Rank Spearman* and *Kendall***

Correlation *Spearman* & *Kendall* includes a nonparametric test. Correlation can be a positive (+) & negative (-) number. If the correlation is positive, the interaction of the two variables is unidirectional, which means that if the independent variable is large, then the dependent variable is large. if the correlation is negative, the interaction of the two variables is not unidirectional, which means that if the independent variable is large, then the dependent variable is getting smaller.

***Mean***

*Mean Rank* is a method to find the average value that ranks highest to lowest rank. For quantitative data contained in a sample, the average is calculated by dividing the number of data values by many data using the following formula:

$$\bar{x} = \frac{\sum_1^n + f_i x_i}{n}$$

Where:

$\bar{x}$ = *mean value* of questionnaire data

n = Number of observations of questionnaire data for each factor

Xi = *Scoring scale* ( 1,2,3,4,5)

Fi = the frequency of each questionnaire observation of each factor

## 3. RESEARCH METHODOLOGY

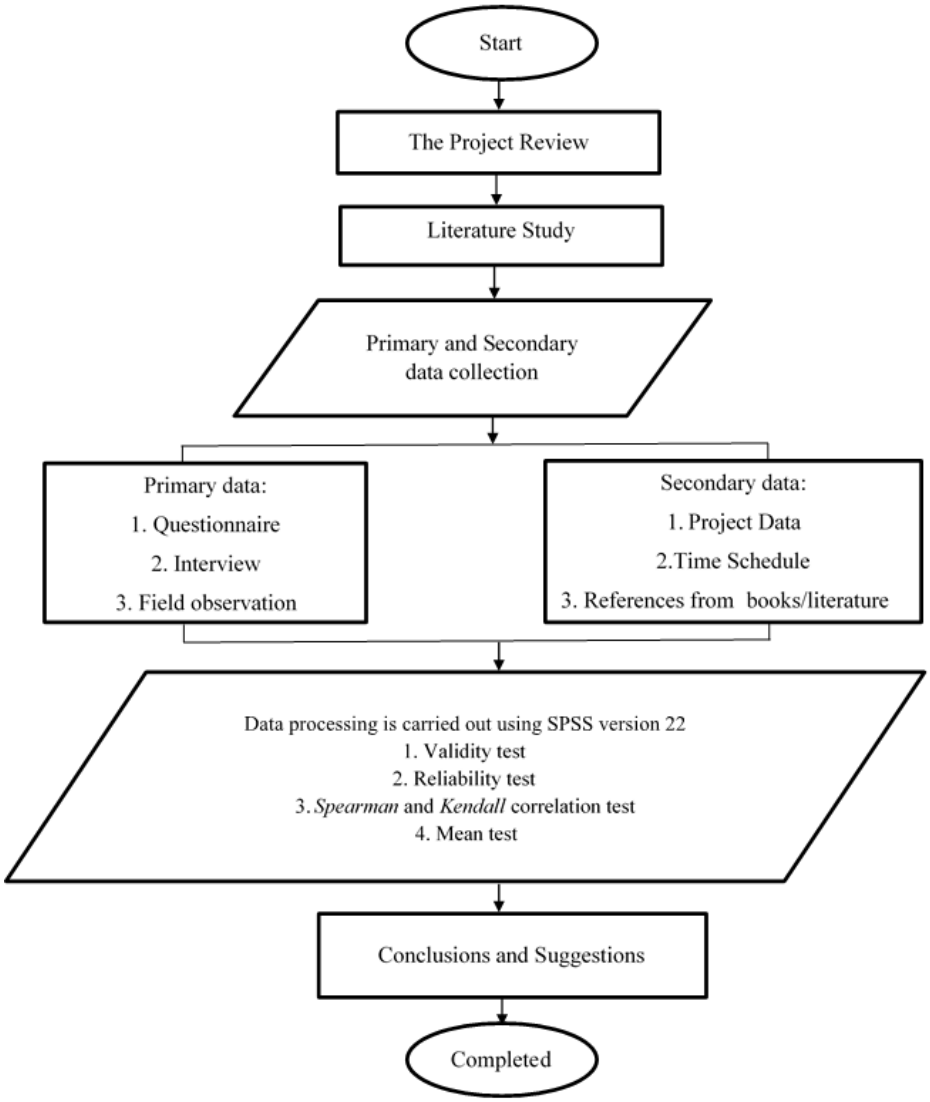


**Figure 2.** Research Flowchart

## 4. RESULT AND DISCUSSION

### Validity

Respondents who are willing to answer this questionnaire 30 people. So, the value of R *(Pearson Correlation)* count > r table **(0.361)** based on the table presented below:

**Table 1.** Validity Test Results Using SPSS

| Variable | r count | r table | Description |
|---|---|---|---|
| X1.1. | 0.830 | 0.361 | Valid |
| X1.2. | 0.901 | 0.361 | Valid |
| X1.3. | 0.799 | 0.361 | Valid |
| X1.4. | 0.752 | 0.361 | Valid |
| X2.1. | 0.833 | 0.361 | Valid |
| X2.2. | 0.543 | 0.361 | Valid |
| X2.3. | 0.568 | 0.361 | Valid |
| X2.4. | 0.721 | 0.361 | Valid |
| X2.5. | 0.616 | 0.361 | Valid |
| X3.1. | 0.518 | 0.361 | Valid |
| X3.2. | 0.909 | 0.361 | Valid |
| X3.3. | 0.717 | 0.361 | Valid |
| X3.4. | 0.949 | 0.361 | Valid |
| X3.5. | 0.873 | 0.361 | Valid |
| X5.1. | 0.586 | 0.361 | Valid |
| X5.2. | 0.760 | 0.361 | Valid |
| X5.3. | 0.870 | 0.361 | Valid |
| X5.4. | 0.685 | 0.361 | Valid |
| X5.5. | 0.686 | 0.361 | Valid |
| X6.1. | 0.658 | 0.361 | Valid |
| X6.2. | 0.574 | 0.361 | Valid |
| X6.3. | 0.413 | 0.361 | Valid |
| X6.4. | 0.574 | 0.361 | Valid |
| X6.5. | 0.619 | 0.361 | Valid |
| Y | 0.960 | 0.361 | Valid |

**Reliability**

The results of the reliability test using Cronbach's Alpha are presented in the image below

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .906 | 30 |

**Figure 3.** The reliability test results

***Rank Spearman* and *Kendall***

Test Spearman and Kendall rank correlation test are presented in the following table:

**Table 2**. Correlation Results of the Spearman Rank Method

| Rank Method | Variable | Correlation Coefficent | Correlation Standard | Description |
|---|---|---|---|---|
| Spearman's rho | X1.1. | -0,055 | 0,5 | Uncorrelated |
| | X1.2. | -0,060 | 0,5 | Uncorrelated |
| | X1.3. | 0,162 | 0,5 | Uncorrelated |
| | X1.4. | 0,000 | 0,5 | Uncorrelated |
| | X2.1. | -0,475 | 0,5 | Uncorrelated |
| | X2.2. | 0,730 | 0,5 | Correlation |
| | X2.3. | 0,802 | 0,5 | Correlation |
| | X2.4. | -0,490 | 0,5 | Uncorrelated |
| | X2.5. | 0,805 | 0,5 | Correlation |
| | X3.1. | 0,148 | 0,5 | Uncorrelated |
| | X3.2. | -0,107 | 0,5 | Uncorrelated |
| | X3.3. | -0,330 | 0,5 | Uncorrelated |
| | X3.4. | -0,930 | 0,5 | Uncorrelated |
| | X3.5. | -0,202 | 0,5 | Uncorrelated |
| | X4.1. | -0,112 | 0,5 | Uncorrelated |
| | X4.2. | -0,080 | 0,5 | Uncorrelated |
| | X4.3. | 0,167 | 0,5 | Uncorrelated |
| | X4.4. | 0,126 | 0,5 | Uncorrelated |
| | X4.5. | -0,080 | 0,5 | Uncorrelated |
| | X5.1. | 0,154 | 0,5 | Uncorrelated |
| | X5.2. | 0,275 | 0,5 | Uncorrelated |
| | X5.3. | 0,079 | 0,5 | Uncorrelated |
| | X5.4. | -0,207 | 0,5 | Uncorrelated |
| | X5.5. | -0,088 | 0,5 | Uncorrelated |
| | X6.1. | -0,015 | 0,5 | Uncorrelated |
| | X6.2. | 0,889 | 0,5 | Correlation |
| | X6.3. | 0,941 | 0,5 | Correlation |
| | X6.4. | 0,114 | 0,5 | Uncorrelated |
| | X6.5. | -0,432 | 0,5 | Uncorrelated |

**Table 3.** Correlation results of *Rank Kendall*

| Rank Method | Variable | Correlation Coefficent | Correlation Standard | Description |
|---|---|---|---|---|
| Kendall's tau_b | X1.1. | -0,052 | 0,5 | Uncorrelated |
| | X1.2. | -0,056 | 0,5 | Uncorrelated |
| | X1.3. | 0,152 | 0,5 | Uncorrelated |
| | X1.4. | 0,000 | 0,5 | Uncorrelated |
| | X2.1. | -0,440 | 0,5 | Uncorrelated |
| | X2.2. | 0,728 | 0,5 | Correlation |
| | X2.3. | 0,797 | 0,5 | Correlation |
| | X2.4. | -0,447 | 0,5 | Uncorrelated |
| | X2.5. | 0,800 | 0,5 | Correlation |
| | X3.1. | 0,136 | 0,5 | Uncorrelated |
| | X3.2. | -0,097 | 0,5 | Uncorrelated |
| | X3.3. | -0,030 | 0,5 | Uncorrelated |
| | X3.4. | -0,085 | 0,5 | Uncorrelated |
| | X3.5. | -0,187 | 0,5 | Uncorrelated |
| | X4.1. | -0,101 | 0,5 | Uncorrelated |
| | X4.2. | -0,703 | 0,5 | Uncorrelated |
| | X4.3. | -0,152 | 0,5 | Uncorrelated |
| | X4.4. | 0,115 | 0,5 | Uncorrelated |
| | X4.5. | -0,072 | 0,5 | Uncorrelated |
| | X5.1. | 0,143 | 0,5 | Uncorrelated |
| | X5.2. | 0,253 | 0,5 | Uncorrelated |
| | X5.3. | 0,072 | 0,5 | Uncorrelated |
| | X5.4. | -0,193 | 0,5 | Uncorrelated |
| | X5.5. | -0,081 | 0,5 | Uncorrelated |
| | X6.1. | -0,014 | 0,5 | Uncorrelated |
| | X6.2. | 0,886 | 0,5 | Correlation |
| | X6.3. | 0,940 | 0,5 | Correlation |
| | X6.4. | 0,104 | 0,5 | Uncorrelated |
| | X6.5. | -0,405 | 0,5 | Uncorrelated |

**Value *Mean* and Standard Deviation**

Mean Value are presented as follows:

**Item Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| X1.1 | 1.90 | .885 | 30 |
| X1.2 | 2.20 | .997 | 30 |
| X1.3 | 2.43 | 1.104 | 30 |
| X1.4 | 2.53 | .973 | 30 |
| X2.1 | 2.87 | 1.042 | 30 |
| X2.2 | 3.03 | 1.497 | 30 |
| X2.3 | 3.07 | 1.230 | 30 |
| X2.4 | 2.43 | 1.194 | 30 |
| X2.5 | 3.23 | .971 | 30 |
| X3.1 | 2.07 | 1.015 | 30 |
| X3.2 | 2.30 | 1.236 | 30 |
| X3.3 | 2.53 | 1.252 | 30 |
| X3.4 | 2.33 | 1.213 | 30 |
| X3.5 | 2.00 | 1.145 | 30 |
| X4.1 | 2.43 | 1.406 | 30 |
| X4.2 | 2.13 | 1.279 | 30 |
| X4.3 | 2.27 | 1.258 | 30 |
| X4.4 | 2.10 | 1.296 | 30 |
| X4.5 | 2.33 | 1.373 | 30 |
| X5.1 | 2.10 | .995 | 30 |
| X5.2 | 2.07 | .980 | 30 |
| X5.3 | 2.27 | 1.143 | 30 |
| X5.4 | 2.27 | .944 | 30 |
| X5.5 | 2.53 | 1.042 | 30 |
| X6.1 | 2.10 | .845 | 30 |
| X6.2 | 3.77 | 1.223 | 30 |
| X6.3 | 4.07 | .980 | 30 |
| X6.4 | 2.63 | 1.066 | 30 |
| X6.5 | 2.03 | 1.189 | 30 |
| Y | 4.60 | 1.221 | 30 |

**Figure 4.** Test Results Mean

## 5.CONCLUSIONS

Following are the conclusions that can be taken:

1. Factors that cause the project to experience delays First, due to Factor X2 (Scope and contract work documents) by the X2.2 indicator (Changes in the scope of work at the

time of execution) has a *Kendall* 0.728, *Spearman* is 0.730 and the *Rank Mean* is 3.03; the X2.3 indicator (Process of requesting and approving images by the owner) has a *Kendall* 0.797, a *Spearman* 's value of 0.802 and a *Rank Mean* 3.07; The X2.5 indicator (There is a lot of additional work) has a *Kendall* 0.800, a *Spearman* 's score of 0.805 and a *Rank Mean* 3.23. Second, due to the X6 factor (*Force Majeure*) by the X6.2 indicator (weather effect) the *Kendall* is 0.886, the *Spearman* is 0.889 and the *Rank Mean* is 3.77; the X6.3 indicator (the occurrence of natural disasters) has a *Kendall* 0.940, a *Spearman* 's value of 0.941 and a *Rank Mean* 4.07.

2. The dominant factor that causes delays is the X6 (*Force Majuere*) factor by the X6.3 indicator (The occurrence of natural disasters) which has the *Mean Rank* of 4.07. Based on the results of interviews with researchers in the field, the big flood that occurred at the beginning when the project was just about to start, had a significant impact on the timing of this project's implementation. So that this is the dominant factor / main delay in the project.

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